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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 10/530,900 | 04/11/2005 | Warren Thomas Johnson | 2002P87057WOUS | 9243 |

28524 7590 09/04/2007
SIEMENS CORPORATION
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| EXAMINER |
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ANDERSON, DENISE R

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| ART UNIT | PAPER NUMBER |
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1709

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| MAIL DATE | DELIVERY MODE |
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09/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/530,900

Applicant(s)

JOHNSON, WARREN THOMAS

Examiner

Denise R. Anderson

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 24 Aug 2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Drawings

1. The drawings are objected to because the Figure 1 drawing is too dark and the reference numbers and features are barely legible. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 8 is objected to because of the following informality: add the word "to" between "adjacent" and "the" in line 4 of page 10. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Purdy et al. (WO 01/00307 A2, Jan. 4, 2001). An element-by-element matching of each of the claim limitations to the prior art appears below. The claim is in italics and the prior art and examiner's comments are in normal font.

Claim 1. A filtration arrangement (Purdy et al., Page 1, line 3; Figures 1, 2, and 3) *comprising one or more membrane modules* (Purdy et al., Figure 1 where there is one membrane module shown as a combination of reference parts 3) *positioned vertically within a feed tank* (Purdy et al., Figure 1, reference part 1), *each membrane module comprising one or more membranes* (Purdy et al., Figure 1, each reference part 3 is a membrane) *positioned therein, an aeration hood* (Purdy et al., Figure 1, reference parts 2 and 11; Figure 3, the upper wall is

the part with openings 22 and the side wall is reference part 21) *comprising an upper wall* (Purdy et al., Figure 1, reference part 11; Figure 3, the upper wall is the part with openings 22) *and one or more downwardly extending side walls* (Purdy et al., Figure 1, reference part 2; Figure 3, reference part 21) *configured to at least partially shroud said membrane modules within said tank, said aeration hood comprising a number of open-ended tubes* (Purdy et al., Figure 1, reference parts 9 and 10 are small open-ended tubes – within a larger open-ended-tube located in the aeration hood between the side wall and the membranes), *each extending downwardly from said upper wall and forming a respective opening therein, each tube* (Purdy et al., Figure 1, not reference parts 9 and 10 but only the area in the aeration hood that is between the side walls and the membranes) *adapted to have at least one of said modules mounted therein* (Purdy et al., Figure 1, where there is one module shown) *and extending through said respective openings in the upper wall* (Purdy et al., Figure 3, where the openings 22 are shown as extending through the upper wall – as stated at Page 8, lines 12-13) *so as to at least partially surround an outer periphery of an associated module or modules, one or more aeration openings* (Purdy et al., Figure 1, reference parts 9 and 10) *being provided in each tube at a location spaced from a proximal end of said tube, said aeration hood side wall or walls* (Purdy et al., Figure 1, reference part 2 is below reference parts 9; Figure 3, reference part 21 is below reference parts 22) *extending to below the location of*

said aeration openings in said tubes, and gas providing means (Purdy et al., Figure 1, reference parts 8 and 4) for feeding gas into said hood.

Purdy et al. discloses the claimed invention except for the filtration arrangement having more than one membrane module. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the membrane module within the tank, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Claim 2. A filtration arrangement according to claim 1 wherein one or more of said aeration hood side walls are formed by side walls of the feed tank with the upper wall being sealingly attached to the side wall so formed.

Purdy et al. discloses or suggests all claim 1 limitations and further teaches the aeration hood side walls being sealingly attached to the upper wall. Purdy et al., Figure 3, the upper wall is the part with openings 22 and the side wall is reference part 21.

Claim 3. A filtration arrangement according to claim 1 wherein the aeration openings are provided at or adjacent the distal end of each tube and the aeration hood side wall or walls extend to or below the downward extent of a distal end of said tubes.

Purdy et al. discloses or suggests all claim 1 limitations and, in Figure 1, further teaches the aeration openings (reference parts 9) that are at or adjacent to the upper end of each tube (the area in the aeration hood that is between the side walls and the membranes) and the side walls (reference part 2) extend below the bottom end of the tubes.

Claim 4. A filtration arrangement according to claim 1, wherein each membrane module has an associated tube surrounding an outer periphery thereof.

Purdy et al. discloses or suggests all claim 1 limitations and, in Figure 1, further teaches that each membrane module (there is one membrane module shown as a combination of reference parts 3) has an associated tube (the open-ended-tube located in the aeration hood between the side wall and the membranes) surrounding its outer periphery.

Claim 5. A filtration arrangement according to claim 1 wherein the openings comprise a number of through holes located around the periphery of each tube and spaced from the distal end of said tube.

Purdy et al. discloses or suggests all claim 1 limitations and, in Figure 3, teaches openings (reference part 22) that are through holes located around the periphery of the tube (Figure 1, the area in the aeration hood between the side walls and the membranes) and at the end of the tube.

Claim 6. A filtration arrangement according to claim 1 wherein the openings comprise a number of open-ended slots located around the periphery of each tube and extending upwardly from the distal end of said tube.

Purdy et al. discloses or suggests all claim 1 limitations as well as holes located around the periphery of the tube and at the end of the tube. Purdy et al. does not disclose that these holes are slot-shaped. It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute slot-shaped openings for the hole-shaped openings, since applicant has not disclosed that slot-shaped openings solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with hole-shaped openings.

Claim 7. A filtration arrangement according to claim 1 wherein the gas providing means comprise an aeration header located below the aeration hood.

Purdy et al. discloses or suggests all claim 1 limitations and further teaches that the gas providing means includes a header (Figure 1, reference part 4; Figure 3, reference part 24) that is located below the aeration hood (Figure 1, reference parts 2 and 11; Figure 3, the upper wall is the part with openings 22 and the side wall is reference part 21).

Claim 8. A filtration arrangement according to claim 1 wherein said at least one module comprises a sleeve surrounding the outer periphery to prevent flow of

gas therethrough, said sleeve extending part way along the length of the module to define an open region at or adjacent [to] the lower end of the module to allow flow of gas into the module through said open region, said hood being positioned to shroud the module at the location of said open region such that gas passing through said aeration openings may pass through said open region into the module membranes.

Purdy et al. discloses or suggests all claim 1 limitations and, in Figure 3, further teaches a sleeve that extends part way along the lower end of the module. In Figure 1, the sleeve (reference part 2) extends the entire length of the module and gas flow may occur between the sleeve periphery and the module interior – as well as out the sleeve top. In summary, Purdy et al. discloses or suggests all claim 8 limitations.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Purdy et al. (WO 01/00307 A2, Jan. 4, 2001), in further view of Cote et al. (US Pat. No. 6,303,035 B1, Oct. 16, 2001). The claim appears below in italics with the prior art and examiner's comments in normal font.

Claim 9. A method of cleaning membrane modules in arrangement according to claim 1, the method comprising the steps of:

i) suspending the filtration operation;

- ii) displacing feed liquid within the aeration hood to a level below the location of said aeration openings in each tube by feeding gas into said aeration hood while maintaining a liquid seal with the distal end of each tube;*
- iii) passing said gas through said aeration openings into said tubes and along surfaces of membranes within each membrane module to dislodge accumulated fouling materials therefrom;*
- iv) recommencing the filtration operation.

Purdy et al. discloses or suggests all the claim 1 limitations and further teaches that aeration is carried out during the filtration operation. Purdy et al., Page 7, lines 11-15. Purdy does not teach a separate filtration step and aeration step. Purdy also does not teach to lower the water level between the filtration step and the aeration step. Cote et al. teaches both.

Cote et al. discloses an "immersed membrane filtration process" that has a filtration ("permeation") step, a separate "aeration" step, and a "draining" step. Cote et al., Title; Figure 1, steps 102, 104, and 108. Cote et al. also discloses that "gentle" aeration is helpful during the filtering operation to "disperse the solids in the tank water near the membranes" but it is not meant to "dislodge significant amounts of solids from the membranes" as is done in the aeration step proper. Cotes et al., Column 5, lines 35-44. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Purdy et al. filtering arrangement, to run the aeration step separately from the filtering operation as taught by Cote et al., since Cote et al. states at Column 5 lines 35-

44 that such a modification would clean the membranes better because more vigorous aeration could be done during the aeration step relative to the gentle aeration done during the filtration operation.

Cote et al. implicitly teaches lowering the water level between the filtration step and the aeration step when it is stated that "solids must be removed from the tank in order (a) to preserve a mass balance and (b) to prevent rapid fouling of the membranes which occurs when the membranes are operated in water containing a high concentration of solids." Cote et al., Column 1, lines 35-39.

One can do this with "a continuous bleed of tank water, which may be called retenate" or by draining the tank water "at discrete intervals." Cote et al., Column 1, lines 61-66. It also would have been obvious to one having ordinary skill in the art at the time the invention was made to, in the Purdy et al. filtering arrangement, remove the retenate either continuously or in discrete intervals (i.e. to lower the water level by draining or partially draining the tank after the filtering operation) as taught by Cote et al., since Cote et al. states at Column 1, lines 35-39 that such a modification would "preserve a mass balance" and "prevent rapid fouling of the membranes which occurs when the membranes are operated in water containing a high concentration of solids."

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references contain many claim limitations of applicant's filtering arrangement.

| | | | |
|----------------|------------|------------|------------------------------|
| US 6576136 B1 | 06/10/2003 | 210/636 | De Moel; Petrus Jacob et al. |
| US 6402955 B2 | 06/11/2002 | 210/636 | Ookata; Masanobu |
| US 6280626 B1 | 08/28/2001 | 210/636 | Miyashita; Satoshi et al. |
| WO 200132299 A | 05/10/2001 | B01D 63/02 | FUTSELAAR, H et al. |
| US 6214232 B1 | 04/10/2001 | 210/651 | Baurmeister; Ulrich et al. |
| US 6045698 A | 04/04/2000 | 210/636 | Cote ; Pierre et al. |
| US 5906739 A | 05/25/1999 | 210/321.81 | Osterland; Niels et al. |

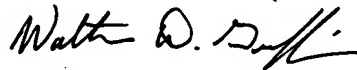
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is 571-272-1447. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA



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SUPERVISORY PATENT EXAMINER